

Serial No. 10/672,009

Dkt.: P-22022.00

Filing Date: September 26, 2003

Title: SURGICAL CONNECTION APPARATUS AND METHODS

AMENDMENTS

Listing of Claims:

This listing of claims will replace all prior versions, and listings of claims in the application.

1. (Original) Surgical connection apparatus comprising:
a support structure;
a plurality of self-closing clips, each clip being releasably coupled to said support structure; and
a plurality of barbs, each barb being coupled to said support structure, said barbs being separate from said clips, which are ejectable from said support structure independently of said barbs.
2. (Original) The apparatus of claim 1 wherein said support structure comprises a plurality of members, each clip being releasably coupled to one of said plurality of members.
3. (Original) The apparatus of claim 2 wherein each of said plurality of members comprises a tubular member and each clip is slidably disposed in a tubular member.
4. (Currently Amended) The apparatus of claim 3 further including a plunger movably coupled to said support structure and a pusher disposed in each of said plurality of members, each pusher having a proximal end being secured to said plunger and a distal end portion coupled to a respective clip so that movement of said plunger moves all of said clips therewith.
5. (Currently Amended) The apparatus of claim 4 wherein each clip has a memory set closed configuration, when said clips are disposed in said tubular members each tubular member biases a respective clip away from said closed configuration, and when said clips are released from said tubular members said clips move toward their memory set closed configuration.

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6. (Original) The apparatus of any one of claims 1-3 further including means for simultaneously deploying said clips.
7. (Original) The apparatus of any one of claims 1-5 wherein said barbs are slidably coupled to said support structure.
8. (Original) The apparatus of claim 1 wherein said support structure comprises a first plurality of members, each clip being releasably coupled to one of said first plurality of members, and a second plurality of members, each barb being slidably coupled to one of said second plurality of members.
9. (Original) The apparatus of claim 8 wherein each of said first and second plurality of members comprises a tubular member and each of said clips and barbs are slidably disposed in a respective tubular member.
10. (Original) The apparatus of 9 further including a plunger movably coupled to said support structure and a pusher disposed in each of said first plurality of members, each pusher having a proximal end being secured to said plunger and a distal end portion coupled to a respective clip so that movement of said plunger moves all of said clips therewith.
11. (Original) The apparatus of claim 10 further including a second plunger movably coupled to said support structure, each barb having a distal end and a proximal end, said second plunger being coupled to each barb proximal end so that said second plunger moves all of said barbs therewith.
12. (Currently Amended) The apparatus of claims 10 or 11 wherein each clip has a memory set closed configuration, when said clips are disposed in said first plurality of tubular members each tubular member biases a respective clip away from said closed configuration, and when said clips are released from said tubular members said clips move toward their memory set closed configuration.
13. (Currently Amended) The apparatus of claims 10 or 11 wherein each barb has a distal portion with a memory set hook configuration, when said barb distal end portions are disposed in said second plurality of tubular members each tubular

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member biases a respective barb distal end portion away from said hook configuration, and when said barb distal end portions are extended away from said tubular members said barbs move toward their memory set hook configuration.

14. (Currently Amended) The apparatus of claims 8 or 9 further including means for simultaneously deploying said clips.

15. (Currently Amended) The apparatus of claims 8 or 9 further including means for simultaneously deploying said barbs.

16. (Currently Amended) The apparatus of claims 8 or 9 further including means for simultaneously deploying said clips and means for simultaneously deploying said barbs independently of said clips.

17. (Original) Surgical connection apparatus comprising:

a support structure forming a first plurality of paths and a second plurality of paths;

a plurality of clips, each clip being slidably disposed in one path of said first plurality of paths; and

a plurality of barbs, each barb being slidably disposed in one path of said second plurality of paths.

18. (Currently Amended) The ~~anastomosis~~ anastomosis apparatus of claim 17 wherein said clips are separate from ~~and~~ said barbs and are movable independently of said barbs.

19. (Original) The apparatus of claim 17 further including a plunger movably coupled to said support structure and a pusher disposed in each of said first plurality of paths, each pusher having a proximal end being secured to said plunger and a distal end portion coupled to a respective clip so that movement of said plunger moves all of said clips therewith.

20. (Original) The apparatus of claim 19 further including a second plunger movably coupled to said support structure, each barb having a distal end and a

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proximal end, said second plunger being coupled to each barb proximal end so that said second plunger moves all of said barbs therewith.

21. (Original) The apparatus of claim 20 wherein said plungers are independently movable.

22. (Original) Surgical connection apparatus for connecting a first structure to a second structure, said connection apparatus comprising a support structure, a plurality of barbs coupled to said support structure, a plurality of clips being slidably coupled to said support structure and unattached to said barbs; means for moving said barbs; and means for ejecting said clips from said support structure.

23. (Original) The apparatus of claim 22 wherein said clips comprise shape memory material, have a memory set closed configuration, and move toward said closed configuration when ejected from said support structure.

24. (Original) The apparatus of claim 23 wherein said clip ejecting means ejects said clips simultaneously.

25. (Original) The apparatus of claim 22 wherein said clip ejecting means ejects said clips simultaneously.

26. (Original) The apparatus of claim 25 wherein said barb moving means provides means for extending the barbs from said support structure and retracting the barbs into said support structure.

27. (Original) The apparatus of any one of claims 24-26 wherein said barb moving means moves said barbs simultaneously.

28. (Original) Surgical connection apparatus for connecting a first structure to a second structure, said connection apparatus comprising a support structure, a plurality of barbs coupled to said support structure, a plurality of clips being slidably coupled to said support structure and unattached to said barbs; and means for simultaneously ejecting said plurality of clips.

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29. (Original) The apparatus of claim 28 wherein said clips comprise shape memory material, have a memory set closed configuration, and move toward said memory set closed configuration when ejected from said support structure.

30. (Original) The apparatus of claim 28 further including means for moving said barbs between a first position where they extend from said support structure and a second position where they are retracted into said support structure.

31. (Original) Surgical connection apparatus for connecting a first structure to a second structure, said connection apparatus comprising a support structure, a plurality of barbs, each coupled to said support structure and having a distal end portion, a plurality of clips slidably coupled to said support structure, means for moving said barbs between a first position where said distal end portions are inside said support structure to a second position where said distal end portions extend from said support structure; and means for ejecting said clips from said support structure.

32. (Original) The apparatus of claim 31 wherein said ejecting means provides means for ejecting said clips simultaneously.

33. (Currently Amended) The apparatus of claims 31 or 32 wherein said barb moving means moves said barbs simultaneously.

34. (Withdrawn) A method of performing an anastomosis comprising:

everting a tubular graft structure over a support structure and passing a plurality of barbs from the support structure into the graft to secure the graft to the support structure;

introducing the everted portion of the tubular graft structure into an opening formed in a second tubular structure; and

simultaneously passing a plurality of clips through the tubular graft structure and second tubular structure to secure the graft and second tubular structures together.

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35. (Withdrawn) The method of claim 34 wherein said barbs are simultaneously passed through said tubular graft structure.

36. (Withdrawn) The method of claim 35 wherein said barbs and clips are moved independently of one another.

37. (Withdrawn) The method of claim 35 wherein said clips each have a memory set closed configuration and are allowed to simultaneously move toward their memory set closed configurations as they are passed through said tubular graft structure and second tubular structure.

38. (Withdrawn) The method of claim 37 wherein said barbs have a distal portion with a memory set configuration and are allowed to simultaneously move toward said memory set closed configuration as they are passed through the tubular graft structure.

39. (Withdrawn) A method of surgically connecting structures in patient comprising:

placing a first structure on a support structure and passing a plurality of barbs from the support structure into the first structure to secure the first structure to the support structure;

placing the support structure adjacent a second structure in a patient; and

simultaneously passing a plurality of clips through the first and second structures to secure the first and second structures together.

40. (Withdrawn) The method of claim 39 wherein each of the clips have a memory set closed configuration and are allowed to simultaneously move toward their memory set closed configuration as they are passed through the first and second structures.